

Attorney Docket No. INK-001

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant(s): In Kwon Jeong

Group Art Unit: 3723

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Examiner: Wilson, Lee D.

For: APPARATUS AND METHOD FOR POLISHING SEMICONDUCTOR
WAFERS USING ONE OR MORE PIVOTABLE LOAD-AND-UNLOAD
CUPS

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Commissioner for Patents
P.O. Box 1450
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BRIEF ON APPEAL

Sir/Madam:

This brief is in furtherance of Applicant's Notice of Appeal filed on June 14, 2007, appealing the decision of the Examiner dated March 16, 2007 finally rejecting claims 1-37.

I. Real Party in Interest

The real party in interest in this appeal is INOPLA Inc., a California Corporation, having a place of business at 1930 Junction Avenue, San Jose, California 95131.

II. Related Appeals and Interferences

There are currently no related appeals or interference proceedings in progress that will directly affect, or be directly affected by, or have a bearing on the Board's decision in the present Appeal.

III. Status of Claims

Claims 1-38 were originally filed with the application on January 27, 2004. In a response to a non-final Office Action of September 13, 2006 filed on December 12, 2006, claim 38 was canceled and claims 16, 24, 30, 34, 35 and 36 were amended. No claims have been amended, canceled, or added for purposes of this Appeal.

Claims 1-5, 7, 8, 10-14, 17-21, 24-26 and 29-37 stand rejected under 35 U.S.C. §102(e) as allegedly being anticipated by U.S. Patent Application Publication No. US 2004/0009738 A1 (hereinafter "Doi et al."). Claims 1-5, 7, 8, 10-14, 17, 18, 24-26 and 29-37 also stand rejected under 35 U.S.C. §102(e) as allegedly being anticipated U.S. Patent No. US 6,626,744 (hereinafter "White et al."). Claims 1-3 also stand rejected under 35 U.S.C. §102(e) as allegedly being anticipated by U.S. Patent No. US 6,942,545 (hereinafter "Jeong"). Claims 1-8 also stand rejected under 35 U.S.C. §102(e) as allegedly being anticipated by U.S. Patent No. US 5,924,916 (hereinafter "Yamashita"). Claims 6, 9, 15, 16, 22, 23, 27 and 28 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Doi et al. in view of U.S. Patent No. US 6,309,279 (hereinafter "Bowman et al.").

This Appeal is made with regard to pending claims 1-37.

IV. Status of Amendments

No amendments were filed subsequent to final rejection.

V. Summary of Claimed Subject Matter

The claimed invention is an apparatus and method for polishing objects, such as semiconductor wafers, utilizing one or more pivotable load-and-unload cups to transfer objects to and/or from one or more object carriers to polish the objects (See lines 15-18 on page 2 in paragraph [0006]).

According to an embodiment of the invention, as recited in claim 1, an apparatus (100) for polishing objects comprises a polishing surface (See Fig. 1, lines 28-32 on page 8 in paragraph [0070]), and lines 3-4 and 8-11 on page 9 in paragraph [0071]), an object carrier (162a, 162b, 162c or 162d) positioned over the polishing surface (See Fig. 1, lines 28-32 on page 8 in paragraph [0070], and lines 12-13 and 27-28 on page 9 in paragraph [0072]), and a load-and-unload cup (182x or 182y) configured to be pivoted to the object carrier about a pivoting point (185x or 185y) over the polishing surface so that the object can be transferred from the load-and-unload cup to the object carrier (See Fig. 1, lines 28-32 on page 8 in paragraph [0070], lines 1-3 on page 10 in paragraph [0073], and lines 7-10 on page 11 in paragraph [0076]).

According to an embodiment, as recited in claim 10, a method for polishing objects comprises pivoting an object to be polished to an object carrier (162a, 162b, 162c or 162d) about a pivoting point (185x or 185y) over a polishing surface (See Fig. 4(a) and lines 29-33 on page 11 in paragraph [0077]), loading the object onto the object carrier (See Fig. 4(b) and line 33 on page 11 and lines 1-2 on page 12 in paragraph [0077]), moving the object carrier so that the object on the object carrier is

placed on the polishing surface (See lines 28-32 on page 9 in paragraph [0072]), and polishing the object on the polishing surface (See Fig. 8(c) and lines 8-10 on page 14 in paragraph [0087]).

According to another embodiment, as recited in claim 17, an apparatus for polishing objects comprises at least one polishing surface (See Fig. 1, lines 28-32 on page 8 in paragraph [0070]), and lines 3-4 and 8-11 on page 9 in paragraph [0071]), a first object carrier (162a or 162c) positioned over at least one polishing surface (See Fig. 1, lines 28-32 on page 8 in paragraph [0070], and lines 12-13 and 27-28 on page 9 in paragraph [0072]), a second object carrier (162b or 162d) positioned over at least one polishing surface (See Fig. 1, lines 28-32 on page 8 in paragraph [0070], and lines 12-13 and 27-28 on page 9 in paragraph [0072]), a load-and-unload cup (182x or 182y) configured to move between the first and second object carriers to transfer one of first and second objects to be polished to one of the first and second object carriers (See Fig. 1, lines 28-32 on page 8 in paragraph [0070], lines 1-3 on page 10 in paragraph [0073], and lines 16-19 on page 10 in paragraph [0073]), and an object transport device (140) configured to transfer the first and second objects to and from the load-and-unload cup (See Fig. 1 and lines 12-17 on page 8 in paragraph [0069]). The first object carrier is configured to hold the first object (See lines 13-15 on page 9 in paragraph [0072]). The second object carrier is configured to hold one of first and second objects (See lines 13-15 on page 9 in paragraph [0072]).

According to another embodiment, as recited in claim 24, a method for polishing objects comprises transporting an object to be polished to a load-and-unload cup (182x) (See Fig. 8(a) and lines 2-4 on page 14 in paragraph [0085]), moving the load-and-unload cup to a first object carrier (162a) (See Fig. 8(b) and lines 5-7 on page 14 in paragraph [0086]), including pivoting the load-and-unload cup (See Fig. 4(a) and lines 29-33 on page 11 in paragraph [0077]), loading the object onto the first object carrier (See Fig. 4(b) and line 33 on page 11 and lines 1-2 on page 12 in paragraph [0077]), moving the first object carrier so that the object on the first object

carrier is placed on at least one polishing surface (See lines 28-32 on page 9 in paragraph [0072]), and polishing the object on at least one polishing surface (See Fig. 8(c) and lines 8-10 on page 14 in paragraph [0087]).

According to another embodiment, as recited in claim 29, an apparatus comprises an object transport device (140) and first and second polishing units (620a and 620b) (See Fig. 34(b), lines 24-27 on page 39 in paragraph [00195], and lines 9-11 on page 42 in paragraph [00203]). Each of the first and second polishing units includes first and second polishing surfaces (See Figs. 21 and 34(b), and lines 17-19 on page 30 in paragraph [00158]), a first object carrier (162a) positioned over the first polishing surface (See Figs. 21 and 34(b), and lines 19-22 on page 30 in paragraph [00158]), a second object carrier (162b) positioned over the second polishing surface (See Figs. 21 and 34(b), and lines 19-22 on page 30 in paragraph [00158]), a first load-and-unload cup (182x) configured to be pivoted to the first object carrier to transfer a first object to and from the first object carrier (See Figs. 21 and 34(b), and lines 24-27 on page 30 in paragraph [00158]), and a second load-and-unload cup (182y) configured to be pivoted to the second object carrier to transfer a second object to and from the second object carrier (See Figs. 21 and 34(b), and lines 24-27 on page 30 in paragraph [00158]). The first object carrier is configured to hold the first object (See lines 13-15 on page 9 in paragraph [0072]). The second object carrier is configured to hold the second object (See lines 13-15 on page 9 in paragraph [0072]). The wafer transport device is configured to transfer the first and second objects to and from the first and second load-and-unload cups of at least one of the first and second polishing units (See Fig. 34(b) and lines 4-6 on page 40 in paragraph [00197]).

According to another embodiment, as recited in claim 30, an apparatus comprising a polishing surface (See Fig. 1, lines 28-32 on page 8 in paragraph [0070]), a first object carrier (162a or 162b) and a second object carrier (162c or 162d) positioned over the polishing surface (See Fig. 1, lines 28-32 on page 8 in

paragraph [0070], and lines 12-13 and 27-28 on page 9 in paragraph [0072]), a first load-and-unload cup (182x) configured to be pivoted to the first object carrier to transfer a first object to and from the first object carrier (See Fig. 1, lines 28-32 on page 8 in paragraph [0070], lines 1-3 on page 10 in paragraph [0073], and lines 16-20 on page 10 in paragraph [0074]), and a second load-and-unload cup (182y) configured to be pivoted to the second object carrier to transfer a second object to and from the second object carrier (See Fig. 1, lines 28-32 on page 8 in paragraph [0070], lines 1-3 on page 10 in paragraph [0073], and lines 20-23 on page 10 in paragraph [0074]). The first object carrier is configured to hold the first object (See lines 13-15 on page 9 in paragraph [0072]). The second object carrier is configured to hold the second object (See lines 13-15 on page 9 in paragraph [0072]).

According to another embodiment, as recited in claim 33, a method for polishing objects comprises pivoting a first object to be polished to a first object carrier (162a or 162b) positioned over a polishing surface and a second object to be polished to a second object carrier (162c or 162d) positioned over the polishing surface (See Figs. 8(b) and 8(e), lines 5-7 on page 14 in paragraph [0086] and lines 20-23 on page 14 in paragraph [0089]), loading the first object onto the first object carrier and the second object onto the second object carrier (See Figs. 8(b) and 8(e), lines 5-7 on page 14 in paragraph [0086] and lines 20-23 on page 14 in paragraph [0089]), independently moving the first and second object carriers so that the first object on the first object carrier and the second object on the second object carrier are placed on the polishing surface (See Figs. 8(c) and 8(f), and lines 21-32 on page 9 in paragraph [0072]), and independently polishing the object on the polishing surface (See Figs. 8(c) and 8(f), lines 8-10 on page 14 in paragraph [0087] and lines 24-26 on page 14 in paragraph [0090]).

According to another embodiment, as recited in claim 35, an apparatus comprises at least one polishing surface (See Fig. 27(a) and lines 9-11 on page 34 in paragraph [00172]), at least one object carrier (162a and 162b) positioned over at

least one polishing surface (See Fig. 27(a) and lines 9-11 on page 34 in paragraph [00172]), a first load-and-unload cup (182x) configured to be pivoted to at least one object carrier about a pivoting point (185) to transfer a first object to at least one object carrier (See Fig. 27(a) and lines 22-25 on page 34 in paragraph [00173]), and a second load-and-unload cup (182y) configured to be pivoted to at least one object carrier about the pivoting point (185) to transfer a second object to at least one object carrier (See Fig. 27(a) and lines 22-25 on page 34 in paragraph [00173]).

VI. Grounds of Rejection to be Reviewed on Appeal

Whether claims 1-5, 7, 8, 10-14, 17-21, 24-26 and 29-37 are anticipated under 35 U.S.C. §102(e) by Doi et al.

Whether claims 1-5, 7, 8, 10-14, 17, 18, 24-26 and 29-37 are anticipated under 35 U.S.C. §102(e) by White et al.

Whether claims 1-3 are anticipated under 35 U.S.C. §102(e) by Jeong.

Whether claims 1-8 are anticipated under 35 U.S.C. §102(e) by Yamashita.

Whether claims 6, 9, 15, 16, 22, 23, 27 and 28 are unpatentable under 35 U.S.C. §103(a) over Doi et al. in view of Bowman et al.

VII. Argument

A. Rejection of Independent Claims 1, 29, 30 and 35 Under 35 U.S.C. §102(e)

In the Final Office Action of March 16, 2007, the Examiner rejected the independent claims 1, 29, 30 and 35 under 35 U.S.C. §102(e) as allegedly being anticipated by Doi et al. The Examiner also rejected the independent claims 1, 29, 30 and 35 under 35 U.S.C. §102(e) as allegedly being anticipated by White et al. The Examiner also rejected the independent claim 1 under 35 U.S.C. §102(e) as allegedly being anticipated by Jeong. The Examiner also rejected the independent claim 1 under 35 U.S.C. §102(e) as allegedly being anticipated by Yamashita. However,

every element set forth in the independent claims 1, 29, 30 and 35 is not disclosed in any one of these cited references. Thus, the independent claims 1, 29, 30 and 35 are not anticipated by these cited references.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Thus, if a single element of a claim is not disclosed in a single prior art reference, then the claim cannot be anticipated by that prior art reference.

Each of the independent claims 1, 29, 30 and 35 recites at least one “*load-and-unload cup configured to be pivoted...*,” which is not disclosed in the cited references of Doi et al., White et al., Jeong and Yamashita.

With respect to the cited reference of Doi et al., the Examiner states on page 2 of the Final Office Action that this cited reference discloses “loading and unload cups (35 a-b).” However, in paragraph [0033] of the cited reference of Doi et al., the cited elements 35A and 35B are referred to as “dressing devices” that are used “to dress a polishing pad on each of the polishing platens 34A, 34B, 34C.” These “dressing devices” are not used to transfer objects, such as wafers, as is the case for the claimed “*load-and-unload cup*.” Thus, these “dressing devices” are clearly not equivalent to the claimed “*load-and-unload cup*,” as recited in claims 1, 29, 30 and 35. Thus, these claims 1, 29, 30 and 35 are not anticipated by the cited reference of Doi et al.

With respect to the cited reference of White et al., the Examiner states on page 3 of the Final Office Action that this cited reference discloses “loading and unload cups (166&172).” However, in column 3, lines 7-15, of the cited reference of White et al., the cited element 166 is referred to as “a conventional robot” that is “commonly used to transfer substrates of wafers 126 into and out of and one or more wafer cassettes 168.” In addition, in column 3, lines 16-17, of the cited reference of White

et al., the cited element 172 is referred to as “an edge grip robot.” Applicant notes herein that the element 126 on the robot 166 is a substrate or a wafer, as described in column 3, lines 9-10, of White et al. Thus, these “robots” are clearly not equivalent to the claimed “*load-and-unload cup*,” as recited in claims 1, 29, 30 and 35. In fact, the cited reference of White et al. discloses “load cups 164”. However, these load cups 164 of White et al. are configured to be moved linearly, as shown in Fig. 1, and not “configured to be pivoted,” as recited in claims 1, 29, 30 and 35. Thus, claims 1, 29, 30 and 35 are not anticipated by the cited reference of White et al.

With respect to the cited reference of Jeong, the Examiner states on page 3 of the Final Office Action that this cited reference discloses “the invention as claimed in claims 1-3” without any reasoning or analysis. The cited reference of Jeong does disclose a wafer load/unload cup unit 1202, as illustrated in Fig. 12. As stated in column 10, lines 29-31, “[t]he semiconductor wafers are transported to and from the wafer unload/load cup unit by the wafer transport arm 108.” Therefore, this wafer load/unload cup unit 1202 of Jeong is not “configured to be pivoted,” as recited in claims 1, 29, 30 and 35. Thus, claims 1, 29, 30 and 35 are not anticipated by the cited reference of Jeong.

With respect to the cited reference of Yamashita, the Examiner states on page 3 of the Final Office Action that this cited reference discloses “the invention as claimed in claims 1-8” without any reasoning or analysis. The cited reference of Yamashita discloses transfer apparatus 3a-3c. However, the cited reference of Yamashita does not disclose the claimed “*load-and-unload cup*,” as recited in claims 1, 29, 30 and 35. Thus, these claims 1, 29, 30 and 35 are not anticipated by the cited reference of Yamashita.

Furthermore, with respect to the independent claim 1, none of the cited references discloses the limitations of “*a load-and-unload cup configured to be pivoted to said object carrier about a pivoting point over said polishing surface so*

that said object can be transferred from said load-and-unload cup to said object carrier to said object carrier” (emphasis added), which further supports Applicant’s position that the independent claim 1 is not anticipated by the cited references.

B. Rejection of Independent Claim 10 Under 35 U.S.C. §102(e)

In the Final Office Action of March 16, 2007, the Examiner rejected the independent claim 10 under 35 U.S.C. §102(e) as allegedly being anticipated by Doi et al. and White et al. However, every element set forth in the independent claim 10 is not disclosed in either Doi et al. or White et al. Thus, the independent claim 10 is not anticipated by these cited references.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Thus, if a single element of a claim is not disclosed in a single prior art reference, then the claim cannot be anticipated by that prior art reference.

The independent claim 10 recites in part “*pivoting an object to be polished to an object carrier about a pivoting point over a polishing surface*,” which is not disclosed in the cited references of Doi et al. and White et al. The cited reference of Doi et al. discloses in paragraph [0045] that “[t]he polishing head 38A waits in advance above the relaying position T_A, and the wafer W is passed to the polishing head 38A from the loading table.” Thus, the cited reference of Doi et al. does not disclose “*pivoting an object to be polished to an object carrier about a pivoting point over a polishing surface*,” as recited in claim 10. The cited reference of White et al. discloses in column 3, lines 28-31 that “the shuttle 162 transfers the unpolished wafer 126 from the load cup 164 to the drive system 104.” The drive system 104 includes polishing heads 124 and 125. As illustrated in Fig. 1, the movement of the shuttle 162 to the drive system 104 is linear. Thus, the cited reference of White et al. does

not disclose “*pivoting an object to be polished to an object carrier about a pivoting point over a polishing surface*,” as recited in claim 10. Consequently, claim 10 is not anticipated by the cited references of Doi et al. and White et al.

C. Rejection of Independent Claim 17 Under 35 U.S.C. §102(e)

In the Final Office Action of March 16, 2007, the Examiner rejected the independent claim 17 under 35 U.S.C. §102(e) as allegedly being anticipated by Doi et al. and White et al. However, every element set forth in the independent claim 17 is not disclosed in either Doi et al. or White et al. Thus, the independent claim 17 is not anticipated by these cited references.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Thus, if a single element of a claim is not disclosed in a single prior art reference, then the claim cannot be anticipated by that prior art reference.

The independent claim 17 recites in part “*a load-and-unload cup configured to be moved between said first and second object carriers to transfer one of said first and second objects to one of said first and second object carriers*,” which is not disclosed in the cited references of Doi et al. and White et al. As explained above in Section A, the cited reference of Doi et al. discloses “dressing devices” 35A and 35B, which are not equivalent to the claimed “*load-and-unload cup*,” as recited in claim 1. Thus, the cited reference of Doi et al. does not disclose “*a load-and-unload cup*,” as recited in claim 17. The cited reference of White et al. does disclose “load cups 164”. However, these load cups 164 of White et al. are not “*configured to be moved between said first and second object carriers*,” as recited in claim 17. Thus, the cited reference of Doi et al. does not disclose “*a load-and-unload cup*,” as recited in claim

17. Consequently, claim 17 is not anticipated by the cited references of Doi et al. and White et al.

D. Rejection of Independent Claim 24 Under 35 U.S.C. §102(e)

In the Final Office Action of March 16, 2007, the Examiner rejected the independent claim 24 under 35 U.S.C. §102(e) as allegedly being anticipated by Doi et al. and White et al. However, every element set forth in the independent claim 24 is not disclosed in either Doi et al. or White et al. Thus, the independent claim 24 is not anticipated by these cited references.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Thus, if a single element of a claim is not disclosed in a single prior art reference, then the claim cannot be anticipated by that prior art reference.

As amended, the independent claim 24 recites in part “*moving said load-and-unload cup to a first object carrier, including pivoting said load-and-unload cup*,” which is not disclosed in the cited references of Doi et al. and White et al. As explained above in Section A, the cited reference of Doi et al. discloses “dressing devices” 35A and 35B, which are not equivalent to the claimed “*load-and-unload cup*,” as recited in claim 24. The cited reference of Doi et al. does not mention any pivoting motion. Thus, the cited reference of Doi et al. does not disclose “*moving said load-and-unload cup to a first object carrier, including pivoting said load-and-unload cup*,” as recited in claim 24. The cited reference of White et al. does disclose “load cups 164”. However, these load cups 164 of White et al. do not pivot. Thus, the cited reference of Doi et al. does not disclose “*moving said load-and-unload cup to a first object carrier, including pivoting said load-and-unload cup*,” as recited in

claim 24. Consequently, claim 24 is not anticipated by the cited references of Doi et al. and White et al.

E. Rejection of Independent Claim 33 Under 35 U.S.C. §102(e)

In the Final Office Action of March 16, 2007, the Examiner rejected the independent claim 33 under 35 U.S.C. §102(e) as allegedly being anticipated by Doi et al. and White et al. However, every element set forth in the independent claim 33 is not disclosed in either Doi et al. or White et al. Thus, the independent claim 33 is not anticipated by these cited references.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Thus, if a single element of a claim is not disclosed in a single prior art reference, then the claim cannot be anticipated by that prior art reference.

The independent claim 33 recites in part “*pivoting a first object to be polished to a first object carrier positioned over a polishing surface and a second object to be polished to a second object carrier positioned over said polishing surface*,” which is not disclosed in the cited references of Doi et al. and White et al. The cited reference of Doi et al. discloses in paragraph [0045] that “[t]he polishing head 38A waits in advance above the relaying position T_A, and the wafer W is passed to the polishing head 38A from the loading table.” The cited reference of Doi et al. does not mention any pivoting motion. Thus, the cited reference of Doi et al. does not disclose “*pivoting a first object to be polished to a first object carrier positioned over a polishing surface and a second object to be polished to a second object carrier positioned over said polishing surface*,” as recited in claim 33. The cited reference of White et al. discloses in column 3, lines 28-31 that “the shuttle 162 transfers the unpolished wafer 126 from the load cup 164 to the drive system 104.” The drive

system 104 includes polishing heads 124 and 125. As illustrated in Fig. 1, the movement of the shuttle 162 to the drive system 104 is linear. Thus, the cited reference of White et al. does not disclose “*pivoting a first object to be polished to a first object carrier positioned over a polishing surface and a second object to be polished to a second object carrier positioned over said polishing surface,*” as recited in claim 33. Consequently, claim 33 is not anticipated by the cited references of Doi et al. and White et al.

Furthermore, the cited references of Doi et al. and White et al. disclose polishing heads that are each positioned over a different polishing surface. Thus, these cited references do not disclose “*a first object carrier positioned over a polishing surface*” and “*a second object carrier positioned over said polishing surface,*” as recited in claim 33. Consequently, claim 33 cannot be anticipated by the cited references of Doi et al. and White et al.

F. Rejection of Dependent Claims 2-9, 11-16, 18-23, 25-28, 31, 32, 34, 36 and 37 Under 35 U.S.C. §102(e) and/or 35 U.S.C. §103(a)

In the Final Office Action of March 16, 2007, the Examiner rejected the dependent claims 2-5, 7, 8, 11-14, 18-21, 25, 26, 31-34, 36 and 37 under 35 U.S.C. §102(e) as allegedly being anticipated by Doi et al. The Examiner also rejected the dependent claims 2-5, 7, 8, 11-14, 18, 25, 26, 31-34, 36 and 37 under 35 U.S.C. §102(e) as allegedly being anticipated by White et al. The Examiner also rejected the dependent claims 2 and 3 under 35 U.S.C. §102(e) as allegedly being anticipated by Jeong. The Examiner also rejected the dependent claims 2-8 under 35 U.S.C. §102(e) as allegedly being anticipated by Yamashita. The Examiner also rejected the dependent claims 6, 9, 15, 16, 22, 23, 27 and 28 as allegedly being unpatentable over Doi et al. in view of Bowman et al.

Each of the dependent claims 2-9, 11-16, 18-23, 25-28, 31, 32, 34, 36 and 37 depends on one of the independent claims 1, 10, 17, 24, 30, 33 and 35. As such, these dependent claims include all the limitations of their respective base claims. Therefore, Applicant respectfully submits that these dependent claims are allowable for at least the same reasons as their respective base claims.

SUMMARY

The independent claims 1, 10, 17, 24, 29, 30, 33 and 35 are not anticipated by the cited references of Doi et al., White et al., Jeong and Yamashita since every element set forth in each of these independent claims is not disclosed by any one of these cited references. In particular, the cited references of Doi et al., White et al., Jeong and Yamashita do not disclose “*load-and-unload cup configured to be pivoted...*,” as recited in the independent claims 1, 29, 30 and 35. The cited references of Doi et al. and White et al. also do not disclose “*pivoting an object to be polished to an object carrier about a pivoting point over a polishing surface,*” as recited in the independent claim 10. The cited references of Doi et al. and White et al. also do not disclose “*a load-and-unload cup configured to be moved between said first and second object carriers to transfer one of said first and second objects to one of said first and second object carriers,*” as recited in the independent claim 17. The cited references Doi et al. and White et al. also do not disclose “*moving said load-and-unload cup to a first object carrier, including pivoting said load-and-unload cup,*” as recited in the independent claim 24. The cited references of Doi et al. and White et al. also do not disclose “*pivoting a first object to be polished to a first object carrier positioned over a polishing surface and a second object to be polished to a second object carrier positioned over said polishing surface,*” as recited in the independent claim 33. With respect to the dependent claims 2-9, 11-16, 18-23, 25-28, 31, 32, 34, 36 and 37, Applicant respectfully submits that these dependent claims are allowable for at least the same reasons as their respective base claims.

For all the foregoing reasons, it is earnestly and respectfully requested that the Board of Patent Appeals and Interferences reverse the rejections of the Examiner regarding claims 1-37, so that this case may be allowed and pass to issue in a timely manner.

Respectfully submitted,
In-Kwon Jeong

Date: August 14, 2007

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VIII. Claims Appendix

- 1 1. An apparatus for polishing objects, said apparatus comprising:
2 a polishing surface;
3 an object carrier positioned over said polishing surface; and
4 a load-and-unload cup configured to be pivoted to said object carrier
5 about a pivoting point over said polishing surface so that said object can be
6 transferred from said load-and-unload cup to said object carrier.

- 1 2. The apparatus of claim 1 further comprising a second object carrier positioned
2 over said polishing surface, and wherein said load-and-unload cup is further
3 configured to be pivoted to said second object carrier so that a second object can be
4 transferred from said load-and-unload cup to said second object carrier.

- 1 3. The apparatus of claim 1 further comprising a second load-and-unload cup
2 configured to be pivoted to said object carrier about a second pivoting point over said
3 polishing surface so that a second object can be transferred from said second load-
4 and-unload cup to said object carrier.

- 1 4. The apparatus of claim 1 further comprising:
2 a second object carrier positioned over said polishing surface; and
3 a second load-and-unload cup configured to be pivoted to said second
4 object carrier about a second pivoting point over said polishing surface so that a

5 second object can be transferred from said second load-and-unload cup to said second
6 object carrier.

1 5. The apparatus of claim 4 further comprising a third object carrier positioned
2 over said polishing surface, wherein said load-and-unload cup and said second load-
3 and-unload cup are further configured to be pivoted to said third object carrier so that
4 a third object can be transferred from one of said load-and-unload cup and said
5 second load-and-unload cup to said third object carrier.

1 6. The apparatus of claim 4 further comprising third and fourth object carriers
2 positioned over said polishing surface, and wherein said load-and-unload cup is
3 further configured to be pivoted to said third object carrier so that a third object can
4 be transferred from said load-and-unload cup to said third object carrier and wherein
5 said second load-and-unload cup is further configured to be pivoted to said fourth
6 object carrier so that a fourth object can be transferred from said second load-and-
7 unload cup to said fourth object carrier.

1 7. The apparatus of claim 1 further comprising a second load-and-unload cup
2 configured to be pivoted to said object carrier about said pivoting point so that a
3 second object can be transferred from said second load-and-unload cup to said object
4 carrier.

1 8. The apparatus of claim 1 further comprising:
2 a second object carrier positioned over said polishing surface; and
3 a second load-and-unload cup configured to be pivoted to said second
4 object carrier about said pivoting point so that a second object can be transferred from
5 said second load-and-unload cup to said second object carrier.

1 9. The apparatus of claim 1 wherein said load-and-unload cup includes a wafer
2 handling lifter that can be vertically extended to load said object onto said object
3 carrier and unload said object from said object carrier.

1 10. A method for polishing objects, said method comprising:
2 pivoting an object to be polished to an object carrier about a pivoting
3 point over a polishing surface;
4 loading said object onto said object carrier;
5 moving said object carrier so that said object on said object carrier is
6 placed on said polishing surface; and
7 polishing said object on said polishing surface.

1 11. The method of claim 10 further comprising:
2 pivoting a second object to be polished to a second object carrier about
3 said pivoting point;
4 loading said second object onto said second object carrier;

5 moving said second object carrier so that said second object on said
6 second object carrier is placed on said polishing surface; and
7 polishing said second object on said polishing surface.

1 12. The method of claim 11 wherein said pivoting of said first object and said
2 pivoting of said second object includes pivoting first and second load-and-unload
3 cups about said pivoting point.

1 13. The method of claim 10 further comprising:
2 pivoting a second object to be polished to said object carrier about a
3 second pivoting point;
4 loading said second object onto said object carrier;
5 moving said object carrier so that said second object on said object
6 carrier is placed on said polishing surface; and
7 polishing said second object on said polishing surface.

1 14. The method of claim 10 further comprising:
2 pivoting a second object to be polished to a second object carrier about
3 a second pivoting point;
4 loading said second object onto said second object carrier;
5 moving said second object carrier so that said second object on said
6 second object carrier is placed on said polishing surface; and
7 polishing said second object on said polishing surface.

1 15. The method of claim 14 further comprising:
2 pivoting a third object to be polished to a third object carrier about one
3 of said pivoting point and said second pivoting point;
4 loading said third object onto said third object carrier;
5 moving said third object carrier so that said third object on said third
6 object carrier is placed on said polishing surface; and
7 polishing said third object on said polishing surface.

1 16. The method of claim 15 further comprising:
2 pivoting a fourth object to be polished to a fourth object carrier about
3 one of said pivoting point and said second pivoting point that differs from said third
4 object;
5 loading said fourth object onto said fourth object carrier;
6 moving said fourth object carrier so that said fourth object on said
7 fourth object carrier is placed on said polishing surface; and
8 polishing said fourth object on said polishing surface.

1 17. An apparatus for polishing objects, said apparatus comprising:
2 at least one polishing surface;
3 a first object carrier positioned over said at least one polishing surface,
4 said first object carrier being configured to hold a first object to be polished;

5 a second object carrier positioned over said at least one polishing
6 surface, said second object carrier being configured to hold one of said first object
7 and a second object to be polished;
8 a load-and-unload cup configured to be moved between said first and
9 second object carriers to transfer one of said first and second objects to one of said
10 first and second object carriers; and
11 an object transport device configured to transfer said first and second
12 objects to and from said load-and-unload cup.

1 18. The apparatus of claim 17 wherein said at least one polishing surface includes
2 first and second polishing surfaces, and wherein said first object carrier is positioned
3 over said first polishing surface and said second object carrier is positioned over said
4 second polishing surface.

1 19. The apparatus of claim 18 further comprising:
2 a third polishing surface;
3 a third object carrier positioned over said third polishing surface; and
4 a second load-and-unload cup configured to be moved between said
5 second and third object carriers to transfer said one of said second object and a third
6 object to one of said second and third object carriers.

1 20. The apparatus of claim 19 wherein said first, second and third polishing
2 surfaces are positioned in a linear configuration.

1 21. The apparatus of claim 18 further comprising:
2 third and fourth polishing surfaces;
3 third and fourth object carriers, said third object carrier being
4 positioned over said third polishing surface, said fourth object carrier being
5 positioned over said fourth polishing surface; and
6 a second load-and-unload cup configured to be moved between said
7 third and fourth object carriers to transfer one of said second object, a third object and
8 a fourth object to one of said third and fourth object carriers.

1 22. The apparatus of claim 21 wherein said first, second, third and fourth
2 polishing surface are positioned in an L-shaped configuration.

1 23. The apparatus of claim 17 wherein said load-and-unload cup includes a wafer
2 handling lifter that can be vertically extended to load said object onto said object
3 carrier and unload said object from said object carrier.

1 24. A method for polishing objects, said method comprising:
2 transporting an object to be polished to a load-and-unload cup;
3 moving said load-and-unload cup to a first object carrier, including
4 pivoting said load-and-unload cup, said first object carrier being one of two object
5 carriers to which said load-and-unload cup can be moved;
6 loading said object onto said first object carrier;

7 moving said first object carrier so that said object on said first object
8 carrier is placed on at least one polishing surface; and
9 polishing said object on said at least one polishing surface.

1 25. The method of claim 24 further comprising:

2 moving said load-and-unload cup to a second object carrier to transfer
3 one of said object and a second object, said second object carrier being one of said
4 two object carriers;

5 loading one of said object and said second object onto said second
6 object carrier;

7 moving said second object carrier so that one of said object and said
8 second object on said second object carrier is placed on said at least one polishing
9 surface; and

10 polishing one of said object and said second object on said at least one
11 polishing surface.

1 26. The method of claim 25 wherein said moving of said first object carrier and
2 said moving of said second object carrier include moving said first and second object
3 carriers so that said object on said first object carrier is placed on a first polishing
4 surface and one of said object and said second object on said second object carrier is
5 placed on a second polishing surface.

1 27. The method of claim 25 further comprising:
2 moving a particular load-and-unload cup to transfer one of second
3 object and a third object, said particular load-and-unload cup being one of said load-
4 and-unload cup and a second load-and-unload cup to a third object carrier;
5 loading one of second object and said third object onto said third
6 object carrier;
7 moving said third object carrier so that one of second object and said
8 third object on said third object carrier is placed on a third polishing surface; and
9 polishing one of second object and said third object on said third
10 polishing surface.

1 28. The method of claim 25 further comprising:
2 moving a second load-and-unload cup to a third object carrier to
3 transfer one of said second object and a third object, including moving said second
4 load-and-unload cup to a fourth object carrier to transfer one of said second object
5 and a fourth object;
6 loading one of said second object and said third object onto said third
7 object carrier and one of said second object and said fourth object onto said fourth
8 object carrier;
9 moving said third and fourth object carriers so that one of said second
10 object and said third object on said third object carrier is placed on a third polishing
11 surface and one of said second object and said fourth object on said fourth object
12 carrier is placed on a fourth polishing surface; and

13 polishing one of said second object and said third object on said third
14 polishing surface and one of said second object and said fourth object on said fourth
15 polishing surface.

1 29. An apparatus for polishing objects, said apparatus comprising:
2 first and second polishing units, each of said first and second polishing
3 units comprising:
4 first and second polishing surfaces;
5 a first object carrier positioned over said first polishing surface,
6 said first object carrier being configured to hold a first object to be polished;
7 a second object carrier positioned over said second polishing
8 surface, said second object carrier being configured to hold a second object to be
9 polished;
10 a first load-and-unload cup configured to be pivoted to said
11 first object carrier to transfer said first object to and from said first object carrier; and
12 a second load-and-unload cup configured to be pivoted to said
13 second object carrier to transfer said second object to and from said second object
14 carrier; and
15 a wafer transport device configured to transfer said first and second
16 objects to and from said first and second load-and-unload cups of at least one of said
17 first and second polishing units.

1 30. An apparatus for polishing objects, said apparatus comprising:
2 a polishing surface;
3 first and second object carriers positioned over said polishing surface,
4 said first object carrier being configured to hold a first object to be polished, said
5 second object carrier being configured to hold a second object to be polished, said
6 first and second object carriers being further configured to independently polish said
7 first and second objects on said polishing surface;
8 a first load-and-unload cup configured to be pivoted to said first object
9 carrier to transfer said first object to and from said first object carrier; and
10 a second load-and-unload cup configured to be pivoted to said second
11 object carrier to transfer said second object to and from said second object carrier.

1 31. The apparatus of claim 30 wherein said first and second load-and-unload cups
2 are configured to be pivoted about pivoting points over said polishing surface.

1 32. The apparatus of claim 30 wherein said load-and-unload cup includes a wafer
2 handling lifter that can be vertically extended to load said object onto said object
3 carrier and unload said object from said object carrier.

1 33. A method for polishing objects, said method comprising:
2 pivoting a first object to be polished to a first object carrier positioned
3 over a polishing surface and a second object to be polished to a second object carrier
4 positioned over said polishing surface;

5 loading said first object onto said first object carrier and said second
6 object onto said second object carrier;
7 independently moving said first and second object carriers so that said
8 first object on said first object carrier and said second object on said second object
9 carrier are independently placed on said polishing surface; and
10 independently polishing said first and second objects on said polishing
11 surface.

1 34. The method of claim 33 wherein said pivoting includes pivoting said first
2 object about a first pivoting axis to said first object carrier and said second object
3 about a second pivoting axis to said second object carrier, said first and second
4 pivoting axes being located over said polishing surface.

1 35. An apparatus for polishing objects, said apparatus comprising:
2 at least one polishing surface;
3 at least one object carrier positioned over said at least one polishing
4 surface;
5 a first load-and-unload cup configured to be pivoted to said at least one
6 object carrier about a pivoting axis to transfer a first object to said at least one object
7 carrier; and
8 a second load-and-unload cup configured to be pivoted to said at least
9 one object carrier about said pivoting axis to transfer a second object to said at least
10 one object carrier.

1 36. The apparatus of claim 35 wherein said pivoting axis of said first and second
2 load-and-unload cups is located over said at least one polishing surface.

1 37. The apparatus of claim 36 wherein said at least one polishing surface includes
2 first and second polishing surfaces and said at least one object carrier includes first
3 and second object carriers, said first object carrier being positioned over said first
4 polishing surface, said second object carrier being positioned over said second
5 polishing surface.

Evidence Appendix

NONE

IX. Related Proceedings Appendix

NONE